

Claims

We claim:

1. A method for configuring an IP telephone, comprising:  
5 receiving an identifier from the IP telephone;  
determining if the identifier is valid; and  
if the identifier is valid, assigning a range of port numbers to the IP telephone  
based on the identifier, wherein the IP telephone is operable to use at least a subset of the  
range of port numbers to send or receive IP communications.

10 2. The method of claim 1, wherein said range of port numbers comprises  
ports which are not reserved for use by other IP protocols.

15 3. The method of claim 1, further comprising:  
mediating IP communications between the IP telephone and an IP device, wherein  
the IP telephone uses at least a subset of the range of port numbers to send or receive said  
IP communications.

20 4. The method of claim 3, wherein said mediating the IP communications  
comprises:  
receiving a data packet from the IP telephone,  
performing a network address persistent port translation (NAPPT) on the data  
packet; and  
sending the data packet to the IP device.

25 5. The method of claim 4,  
wherein the data packet comprises a private source IP address, a source port  
number, and destination information associated with the IP device, wherein the private

source IP address comprises a private IP address of the IP telephone, and wherein the source port number comprises a port number in the assigned range of port numbers; and

5       wherein said performing a network address persistent port translation (NAPPT) on the data packet comprises changing the private source IP address to a public source IP address while leaving the source port number unchanged, and wherein the public source IP address and the source port number may be used to uniquely identify the IP telephone.

6.       The method of claim 3, wherein said mediating the IP communications comprises:

10       receiving a data packet from the IP device;  
              performing a network address persistent port translation (NAPPT) on the data packet; and  
              sending the data packet to the IP telephone.

15       7.       The method of claim 6,  
              wherein the data packet comprises a public destination IP address, a destination port number; and source information associated with the IP device, wherein the destination port number comprises a port number in the assigned range of port numbers, and wherein the public destination IP address and the destination port number may be  
20       used to uniquely identify the IP telephone; and

25       wherein said performing a network address persistent port translation (NAPPT) on the data packet comprises using the public destination IP address and the destination port number to uniquely identify the IP telephone, and changing the public destination IP address to a private destination IP address while leaving the destination port number unchanged, wherein the private IP address comprises an IP address of the IP telephone.

8.       The method of claim 1, wherein the identifier comprises a vendor class identifier.

9. The method of claim 1, wherein said determining comprises:  
determining if a MAC ID for the IP telephone is valid; and  
if the MAC ID is determined to be valid, then determining if the identifier is valid.

5 10. The method of claim 1, wherein said identifier is comprised in a DHCP  
discover message, the method further comprising:

issuing a DHCP offer to the IP telephone if the identifier is determined to be  
valid, wherein the DHCP offer comprises DHCP lease information based on the validated  
identifier;

10 the IP telephone issuing a DHCP request in response to the issued DHCP offer;  
storing the DHCP lease information in response to the issued DHCP request;  
the IP telephone storing the DHCP lease information; and  
the IP telephone enabling DHCP settings comprised in the DHCP lease  
information.

15 11. The method of claim 10,  
wherein said DHCP lease information includes the range of port numbers and  
information indicating operational software for the IP telephone, the method further  
comprising:

20 the IP telephone executing the indicated operational software to enable said IP  
communications.

12. The method of claim 10,  
wherein said DHCP lease information includes the range of port numbers and  
25 information indicating operational software for the IP telephone, the method further  
comprising:

the IP telephone issuing a request for the operational software;  
providing the operational software to the IP telephone in response to the issued  
request; and

the IP telephone executing the provided operational software to enable said IP communications.

13. The method of claim 12, wherein said issuing the request for the  
5 operational software comprises issuing a read request to a file transfer server, wherein  
said file transfer server performs said providing the operational software to the IP  
telephone.

14. The method of claim 13, wherein the file transfer server comprises a TFTP  
10 (Trivial File Transfer Protocol) server.

15. The method of claim 1, wherein the range of port numbers comprises one  
or more port numbers.

15 16. A system for performing IP telephony, comprising:  
a network;  
an IP telephone;  
a Service Gateway, wherein the Service Gateway is operable to couple to the IP  
telephone through the network;  
20 wherein the IP telephone is operable to send an identifier to the Service Gateway;  
wherein the Service Gateway is operable to:  
receive an identifier from the IP telephone;  
determine if the identifier is valid; and  
if the identifier is valid, assign a range of port numbers to the IP telephone  
25 based on the identifier;  
wherein the IP telephone is operable to use at least a subset of the range of port  
numbers to send or receive IP communications.

17. The system of claim 16, wherein said range of port numbers comprises ports which are not reserved for use by other IP protocols.

18. The system of claim 16, wherein the Service Gateway is further operable  
5 to mediate IP communications between the IP telephone and an IP device.

19. The system of claim 18, wherein, in mediating the IP communications the Service Gateway is operable to:

receive a data packet from the IP telephone,

10 perform a network address persistent port translation (NAPPT) on the data packet;  
and

send the data packet to the IP device.

20. The system of claim 19,

15 wherein the data packet comprises a private source IP address, a source port number, and destination information associated with the IP device, wherein the private source IP address comprises a private IP address of the IP telephone, and wherein the source port number comprises a port number in the assigned range of port numbers; and

20 wherein said performing a network address persistent port translation (NAPPT) on the data packet comprises changing the private source IP address to a public source IP address while leaving the source port number unchanged, and wherein the public source IP address and the source port number may be used to uniquely identify the IP telephone.

21. The system of claim 18, wherein, in mediating the IP communications the Service Gateway is operable to:

receive a data packet from the IP device;

perform a network address persistent port translation (NAPPT) on the data packet;  
and

send the data packet to the IP telephone.

22. The system of claim 21,

wherein the data packet comprises a public destination IP address, a destination port number; and source information associated with the IP device, wherein the 5 destination port number comprises a port number in the assigned range of port numbers, and wherein the public destination IP address and the destination port number may be used to uniquely identify the IP telephone; and

wherein said performing a network address persistent port translation (NAPPT) on the data packet comprises using the public destination IP address and the destination port 10 number to uniquely identify the IP telephone, and changing the public destination IP address to a private destination IP address while leaving the destination port number unchanged, wherein the private IP address comprises an IP address of the IP telephone.

23. The system of claim 16, wherein the identifier comprises a vendor class 15 identifier.

24. The system of claim 16, wherein, in determining if the identifier is valid, the Service Gateway is operable to:

determine if a MAC ID for the IP telephone is valid; and 20 if the MAC ID is determined to be valid, then determine if the identifier is valid.

25. The system of claim 16, wherein said identifier is comprised in a DHCP discover message, wherein the Service Gateway is further operable to:

issue a DHCP offer to the IP telephone if the identifier is determined to be valid, 25 wherein the DHCP offer comprises DHCP lease information based on the validated identifier;

wherein the IP telephone is further operable to:

issue a DHCP request in response to the issued DHCP offer; 20  
store the DHCP lease information; and

enable DHCP settings comprised in the DHCP lease information; and  
wherein the Service Gateway is further operable to:

store the DHCP lease information in response to the issued DHCP request.

5 26. The system of claim 25,

wherein said DHCP lease information includes the range of port numbers and  
information indicating operational software for the IP telephone, wherein the IP telephone  
is further operable to:

10 execute the indicated operational software to enable said IP  
communications.

27. The system of claim 25,

wherein said DHCP lease information includes the range of port numbers and  
information indicating operational software for the IP telephone, wherein the IP telephone  
15 is further operable to:

issue a request for the operational software;

wherein the Service Gateway is further operable to:

provide the operational software to the IP telephone in response to the  
issued request; and

20 wherein the IP telephone is further operable to:

execute the provided operational software to enable said IP  
communications.

28. The system of claim 27, wherein, in issuing the request for the operational  
25 software, the IP telephone is operable to issue a read request to a file transfer server,  
wherein said file transfer server is operable to provide the operational software to the IP  
telephone.

29. The system of claim 28, wherein the file transfer server comprises a TFTP (Trivial File Transfer Protocol) server.

30. The system of claim 16, wherein the range of port numbers comprises one 5 or more port numbers.

31. A memory medium, wherein the memory medium stores program instructions which are executable to perform:

receiving an identifier from the IP telephone;

10 determining if the identifier is valid; and

if the identifier is valid, assigning a range of port numbers to the IP telephone based on the identifier, wherein the IP telephone is operable to use at least a subset of the range of port numbers to send or receive IP communications.

15 32. The memory medium of claim 31, wherein said range of port numbers comprises ports which are not reserved for use by other IP protocols.

33. The memory medium of claim 31, wherein the program instructions are further executable to perform:

20 mediating IP communications between the IP telephone and an IP device, wherein the IP telephone uses at least a subset of the range of port numbers to send or receive said IP communications.

25 34. The memory medium of claim 33, wherein said mediating the IP communications comprises:

receiving a data packet from the IP telephone,  
performing a network address persistent port translation (NAPPT) on the data packet; and  
sending the data packet to the IP device.

35. The memory medium of claim 34,  
wherein the data packet comprises a private source IP address, a source port  
number, and destination information associated with the IP device, wherein the private  
5 source IP address comprises a private IP address of the IP telephone, and wherein the  
source port number comprises a port number in the assigned range of port numbers; and  
wherein said performing a network address persistent port translation (NAPPT) on  
the data packet comprises changing the private source IP address to a public source IP  
address while leaving the source port number unchanged, and wherein the public source  
10 IP address and the source port number may be used to uniquely identify the IP telephone.

36. The memory medium of claim 33, wherein said mediating the IP  
communications comprises:

15 receiving a data packet from the IP device;  
performing a network address persistent port translation (NAPPT) on the data  
packet; and  
sending the data packet to the IP telephone.

37. The memory medium of claim 36,  
20 wherein the data packet comprises a public destination IP address, a destination  
port number; and source information associated with the IP device, wherein the  
destination port number comprises a port number in the assigned range of port numbers,  
and wherein the public destination IP address and the destination port number may be  
used to uniquely identify the IP telephone; and

25 wherein said performing a network address persistent port translation (NAPPT) on  
the data packet comprises using the public destination IP address and the destination port  
number to uniquely identify the IP telephone, and changing the public destination IP  
address to a private destination IP address while leaving the destination port number  
unchanged, wherein the private IP address comprises an IP address of the IP telephone.

38. The memory medium of claim 31, wherein the identifier comprises a vendor class identifier.

5 39. The memory medium of claim 31, wherein said determining comprises:  
determining if a MAC ID for the IP telephone is valid; and  
if the MAC ID is determined to be valid, then determining if the identifier is valid.

10 40. The memory medium of claim 31, wherein said identifier is comprised in a  
DHCP discover message, wherein the program instructions are further executable to  
perform:

issuing a DHCP offer to the IP telephone if the identifier is determined to be  
valid, wherein the DHCP offer comprises DHCP lease information based on the validated  
identifier;

15 receiving a DHCP request from the IP telephone in response to the issued DHCP  
offer; and

storing the DHCP lease information in response to the issued DHCP request;  
wherein said program instructions comprise IP telephone program instructions  
which are executable to:

20 store the DHCP lease information; and  
enable DHCP settings comprised in the DHCP lease information.

41. The memory medium of claim 40,  
wherein said DHCP lease information includes the range of port numbers and  
25 information indicating operational software for the IP telephone, wherein the indicated  
operational software is executable by the IP telephone to enable said IP communications.

42. The memory medium of claim 40,

wherein said DHCP lease information includes the range of port numbers and information indicating operational software for the IP telephone, wherein the program instructions are further executable to perform:

receiving a request for the operational software from the IP telephone;

5 providing the operational software to the IP telephone in response to the issued request; and

wherein the provided operational software is executable by the IP telephone to enable said IP communications.

10 43. The memory medium of claim 42,

wherein the IP telephone program instructions are executable to issue a read request to a file transfer server;

wherein said program instructions further comprise file transfer server program instructions executable to perform said providing the operational software to the IP 15 telephone.

44. The memory medium of claim 43, wherein the file transfer server comprises a TFTP (Trivial File Transfer Protocol) server.

20 45. The memory medium of claim 31, wherein the range of port numbers comprises one or more port numbers.